



Jamel Maita N. Manaig, MD¹
 Adrian F. Fernando, MD¹
 Kelvin Ken L. Yu, MD²

¹Department of Otorhinolaryngology
 Head and Neck Surgery
 University of Santo Tomas Hospital

²Department of Radiation Oncology
 University of Santo Tomas Hospital

Delay and Completion of Treatment in Head and Neck Cancer Patients Employing a Multidisciplinary Team Approach: A Single Institution Experience

ABSTRACT

Objective: To explore possible associations of a multidisciplinary team approach compared to a non-multidisciplinary team approach on delay and completion of treatment of head and neck cancer patients.

Methods:

Design: Historical Cohort Study

Setting: Tertiary Private Training Hospital

Participants: A total of 240 records of head and neck cancer patients from January 2016 and December 2018 were included in the study; 117 underwent a multidisciplinary team approach and 123 underwent a non-multidisciplinary team approach.

Results: Only 24.79% of head and neck cancer patients under the multidisciplinary team approach had treatment delays compared to 37.40% under the non-multidisciplinary team approach. The proportion of treatment delays was significantly higher ($\chi^2 = 4.44, p = .035$) with the non-multidisciplinary team approach. Comparative treatment completion of 77.78% and 69.11% under the multidisciplinary and non-multidisciplinary team approaches, respectively, were not significantly different ($\chi^2 = 2.31, p = .129$).

Conclusion: The multidisciplinary approach might be associated with decreased delay in treatment among patients with head and neck cancer compared to the non-multidisciplinary team approach. A possible trend toward better treatment completion rate was also observed, but it did not reach statistical significance.

Keywords: patient care team; head and neck neoplasms; time-to-treatment; treatment completion; appointment and schedules; neoplasm staging

Correspondence: Dr. Adrian F. Fernando
 Department of Otorhinolaryngology
 Head and Neck Surgery
 University of Santo Tomas Hospital
 España Boulevard, Sampaloc Manila 1015
 Philippines
 Phone: (632) 8731 3001 local 2478
 Email: usth.orlhns@gmail.com

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Multidisciplinary care (MDC) or the Multidisciplinary Team (MDT) in oncology is a collaboration of specialized medical professionals involved in cancer care with an overall goal of improving treatment efficiency and patient care.¹ MDT planning is integral in head and neck cancer management. The MDT consists of a regulated committee that reviews all new cancer patients and agrees on the therapeutic plan proposed by medical and radiation oncologist and surgical specialists based on their clinical expertise and the evidence available to date.¹ This approach establishes a complete assessment of each patient prior to the start of the treatment.²

The use of MDTs in cancer care is endorsed internationally, although uptake varies.^{1,2} It has been adopted in several countries, but remains a less common model of cancer care in our local setting. It is important to maintain the patient at the core of every decision and comprehend the multidisciplinary process to deliver effective multidisciplinary care and promote treatment care involvement.³ Head and neck cancer management is usually time sensitive. Quantitative and qualitative measures are important bases for the success of management.⁴ A study showed that patients seen in a multidisciplinary clinic had fewer treatment delays, improved treatment efficacy and completeness of care.⁴ Similar findings cannot be inferred locally as significant differences exist in different geographic areas, and there is paucity of evidence for these outcomes in the local setting.

This historical cohort study aims to explore possible associations between the multidisciplinary team approach compared to the non-multidisciplinary team approach on treatment delay and completion among head and neck cancer patients. As a secondary objective, the presence of treatment delay and treatment completion among early and late staged subgroups of head and neck cancer patients are analyzed based on the management approach (MDT vs non-MDT)

METHODS

With the approval of the University of Santo Tomas Hospital Research Ethics Committee (REC-2021-06-084-TR-FR), records of patients diagnosed with primary head and neck cancer malignancy and referred to the UST Hospital Benavides Cancer Institute from January 2016 to December 2018 were considered for inclusion. A list of all head and neck cancer patients was obtained from the patient registry of our cancer institute. Patient charts were retrieved and reviewed to identify whether they met inclusion and exclusion criteria, and whether an MDT approach or non-MDT approach was performed in the management of the patient.

Records of all patients with primary head and neck cancer who

underwent any form and combination of treatment (medical, surgical, or radiotherapy) in the UST Hospital Benavides Cancer Institute from January 2016 to December 2018 were considered for inclusion. Those with incomplete medical records were excluded.

The clinical profiles of eligible patients were collected using a standardized and anonymized data collection form. A reference number was assigned to each patient record and was only known to the authors. In addition, multidisciplinary consultation data forms used during the MDT meetings were also used as references.

Sample size computation for two independent sample proportions was conducted using G*Power version 3.1.9.4. (Available from <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>). Using the study of Townsend, *et al.*⁴ the proportion of respondents with treatment delays was 41% for those who received the multi-disciplinary treatment (MDT) approach, while those who did not receive the MDT approach had a treatment delay of 59%. With these parameters and with a minimum power of 80% at a significance level of 5% (two-tailed), a minimum sample size of 240 charts was needed.

The definition of treatment delay was based on the Townsend *et al.* definition of greater than 30 days from the day of referral to treatment initiation.⁴ Treatment completion was defined as accomplishing the primary therapy discussed and agreed upon by the patient and the health care team (for multidisciplinary team approach) or their primary care physician (for non-multidisciplinary team approach).

Data were analyzed using STATA Statistical Software, Version 13 (Stata Corp LP, College Station, TX, USA). A p-value of .05 was considered statistically significant. Descriptive statistics (mean and standard deviations, frequencies and percentages) were used for variables like age, gender, division, tumor site, stage, and treatment rendered to describe outcome variables. Inferential statistics included between-group comparative analyses using the chi-square test of homogeneity and independent t-test to compare outcome variables such as treatment delay and completion according to approach (multi-disciplinary versus non-multi-disciplinary) and stage status (early versus late stage).

RESULTS

A total of 240 head and neck cancer patient records from January 2016-December 2018 were included in this study, wherein 117 underwent a multidisciplinary team approach and 123 underwent a non- multidisciplinary team approach. The mean age of patients was 53.76 years old (SD = 16.75), and it was statistically higher

**Table 1.** Comparison of the Delay and Completion of Treatment of the Early and Late Stages of Head and Neck Cancer Patients according to the Management Approach (N = 240)

Outcomes	Clinical Stage and Management Approach ^a									
	Early Stage (n=53)					Late or Advanced Stage (n=187)				
	NMDT (n=30)	MDT (n=23)	Total (n=53)	Test Statistic (p-value)	Effect Size	NMDT (n=93)	MDT (n=94)	Total (n=187)	Test Statistic (p-value)	Effect Size
Presence of Treatment Delay	12 (40.00%)	6 (26.09%)	18 (33.96%)	1.12 (.384)	2.12%	34 (36.56%)	23 (24.47%)	57 (30.48%)	3.23 (.082)	1.72%
Treatment Completion	27 (90.00%)	19 (82.61%)	46 (86.79%)	0.62 (.451)	1.17%	58 (62.37%)	72 (76.60%)	130 (69.52%)	4.47 (.035)	2.39%

^aNote: MDT = Multidisciplinary Team Approach; NMDT = Non-Multidisciplinary Team Approach

*Significant at 0.05

[†]Significant at 0.01

($t = 2.12, p = .035$) among the non-multidisciplinary team approach group ($x = 56.09, SD = 15.75$) than the multidisciplinary team approach group ($x = 51.54, SD = 17.42$). In addition, most of the respondents were males (60.42%), and the male to female ratios for the two approaches were not significantly different ($\chi^2 = 1.30, p = .255$). Most patients came from the private division (51.67%), and comparative analysis showed that the proportion of patients in the non-multidisciplinary team approach group who came from the private division (66.67%) was significantly higher ($\chi^2 = 22.73, p = .001$) than those from the multidisciplinary team approach group.

The three most prevalent tumor sites were the nasopharynx (35.42%), larynx (14.58%), and oral cavity (12.50%). Between-group comparisons according to approach also showed that the number of patients in the non-multidisciplinary team approach group who had tumors in the nasopharynx (44.72% vs. 25.64%, $\chi^2 = 3.09, p = .002$), lymph nodes (8.13% vs. 1.70%, $\chi^2 = 2.29, p = .022$), thyroid (6.50% vs. 0.85%, $\chi^2 = 2.30, p = .021$), and orbit (4.87% vs. 0.00%, $\chi^2 = 2.42, p = .016$) were significantly higher than those in the multidisciplinary group. On the other hand, results showed that compared to the multidisciplinary team approach, the number of patients in the non-multidisciplinary team approach who had tumors in the larynx (8.94% vs. 20.51%, $\chi^2 = 2.54, p = .011$), paranasal sinuses (0.00% vs. 9.40%, $\chi^2 = 3.48, p = .001$), and oral cavity (2.44% vs. 23.08%, $\chi^2 = 4.83, p = .001$) were significantly lower. Most participants were also in the late or advanced stage (77.92%).

In terms of the treatment, most participants underwent a combination of treatment modalities. In particular, most participants had a combination of chemotherapy and radiotherapy (43.75%), a combination of all treatment options (19.58%), or a combination of surgery and radiotherapy (14.58%). Results also showed that the

number of participants who had surgery alone (11.97% vs. 2.44%, $\chi^2 = 8.27, p = .004$) or had a combination of all the three treatment options (29.06% vs. 10.57%, $\chi^2 = 13.02, p = .001$) were significantly higher in the multidisciplinary team approach group than in the non-multidisciplinary team approach group.

The between-group comparisons of delay and completion of treatment among the head and neck cancer patients according to management approach showed that 37.40% of participants in the non-multidisciplinary team approach had treatment delays, while 24.79% in the multidisciplinary team approach had treatment delays. Comparative analysis indicated that the proportion of treatment delays was significantly higher ($\chi^2 = 4.44, p = .035$) in the non-multidisciplinary team approach, with an effect size of 1.85% denoting that 1.85% of the difference in proportion may be attributed to the multidisciplinary team approach. On the other hand, results showed that the proportions of treatment completion were 69.11% and 77.78% in the non-multidisciplinary team approach and the multidisciplinary team approach groups, respectively, which were not significantly different ($\chi^2 = 2.31, p = .129$).

Table 1 shows the between-group comparison of delay and completion of treatment of the early and late stages of head and neck cancer patients according to management approach. Among those in the early stage, results indicated that 40% and 90% of those in the non-multidisciplinary team approach group had treatment delays and treatment completion, respectively; on the other hand, those in the multidisciplinary team approach group had a 26.09% treatment delay and 82.61% treatment completion. Comparative analyses indicated that the proportion of treatment delays and treatment completion between the two approaches among early-staged cancers were not statistically different. Among those in the late or advanced stage, results showed

that the non-multidisciplinary team approach group had a 36.56% treatment delay and 62.37% treatment completion, while those in the multidisciplinary team approach group had a treatment delay of 24.47% and a treatment completion of 76.60%. Although comparative analyses among those in the late or advanced stage showed that the proportion of treatment delays between the two approaches were not statistically significant ($\chi^2 = 3.23$, $p = .082$), it can be noted that the proportion of treatment completion was significantly higher ($\chi^2 = 4.47$, $p = .035$) among those in the multidisciplinary team approach (76.60%) than in the non-multidisciplinary team approach (62.37%). In addition, the effect size for treatment completion was 2.39%, suggesting that 2.39% of the difference in the proportion of treatment completion may be attributed to the multidisciplinary team approach.

DISCUSSION

In terms of the primary objective, the performance of MDT was associated with lower rates of treatment delay. Not only does it potentially show that MDT can be beneficial, but it refutes suggestive evidence from the literature that scheduling MDTs can cause time delays in management.⁵ A large, retrospective study supported an association of decreased survival with longer times to treatment initiation.⁶ Our study had similar results to those of Townsend *et al.* showing that MDT cohorts had fewer instances of treatment delay.⁴ According to Nash *et al.*, initial consultation with a member of the head and neck MDT may be associated with fewer treatment delays.⁷ These fewer delays mentioned in their study are likely to be due to the following reasons: First, MDT ensures provision of pertinent clinical information which prevents delaying patient discussion until a later MDT meeting. Second, MDT allows triaging of highly concerning patients seen in clinic requiring more pressing treatments. Lastly, through improved networking among different subspecialties and diagnostic services, diagnostic tests and ancillaries can be facilitated expeditiously.⁷ Murphy *et al.* showed that time to treatment initiation can independently affect the overall survival of patients with head and neck squamous cell carcinoma in that those with more than 46 to 52 days of time to treatment initiation can lead to increase mortality risk.⁶ On the other hand, in terms of treatment completion, the trend toward benefit with the use of the MDT approach requires a larger sample size to further confirm statistical significance. Despite this, it seemed logical to infer that a reduction of treatment delay would likely translate to a greater proportion of treatment completion but this needs further study.

Important differences between MDT and non-MDT approaches

warrant pointing out. Most patients who had MDT were from the clinical division or service wards, while most private division patients utilized the non-MDT approach which is likely related to the financial cost of having a multidisciplinary team under the private division while being free of charge when done under the clinical division. This result suggests that the MDT is underutilized in the private division. Moreover, our study had similar results to those of Friedland and colleagues⁵ in terms of tumor sites, where the MDT approach was utilized more frequently in the following cancers: larynx, paranasal sinuses, oral cavity while the non-MDT approach was significantly utilized more among tumors of the nasopharynx, lymph nodes, thyroid and orbit. The result may be attributed to the complexity of laryngeal, paranasal sinus and oral cavity cancers in terms of treatment which is typically multimodal.⁸

In terms of staging, it is worth noting that most of the patients who underwent MDT were already diagnosed at a late stage with the majority already having stage IV disease. This possibly reflects the nature of late-stage cancers, which are often multisystemic and requires more therapeutic approaches in contrast to early stages of the disease, which are usually locoregional. This also possibly reflects how the Filipino physician's referral practices are usually reserved for late stages of disease.⁹ This contrasts with standard practices where the MDT approach is utilized in cancer patients, regardless of the stage. In terms of the type of treatment, those who had MDT were more likely to undergo a specific treatment regimen, whether single or multimodal. This data is suggestive that the performance of MDT can influence treatment decisions in that it can encourage patients to proceed with multimodality treatment regimens. This is exemplified in the study of Agarwal *et al.* wherein the rate of any treatment, majority of which are multimodal, was higher among patients who underwent MDT (75%) vs non-MDT (61%); (OR 2.80, 95% CI 1.71–4.59, $p < .0001$).¹⁰

For the secondary objective, *Table 1* showed that the incidence of treatment delay was statistically similar whether the patient was diagnosed at an early stage or a late stage. This may indicate that the stage of diagnosis does not significantly affect the timing of initiation of necessary treatment. This is important because it disproves the notion in the literature that MDT for early-stage cancers is not necessary as it can paradoxically lead to time delay for straightforward cases and as such, the MDT scheduling delays outweighs its intended benefits.⁶

To the best of our knowledge, based on a search of HERDIN Plus and MEDLINE (PubMed) using the search terms "Multidisciplinary Team", "MDT", "Head and Neck Cancer", this is the first local study to look at the effect of the MDT approach among Filipino head and neck cancer patients.



This study has its own limitations, such as the lack of other relevant outcomes. Other pertinent outcomes, such as survival rates and tumor response, were incomplete during the review of medical charts which would have been ideal to include in the study. The population was deemed heterogenous and therefore there may be other unidentified confounders that could have affected the results of the study. Moreover, a larger sample size may improve power of the study which can possibly detect significant differences instead of trends toward benefit for treatment completion. We recommend performing a larger prospective correlation or cohort study to further characterize other pertinent outcomes such as mortality rates (both overall mortality rate and case specific mortality rate), tumor response rate, and possibly, cost-benefit analyses. This recommendation is relevant and necessary to improve the management of head and neck cancers; however, this would require a long follow-up period and funding.

In conclusion, the performance of the MDT approach is associated with decreased treatment delays among patients with head and neck cancer in this study. There was also an associated trend toward benefit for the treatment completion rate, but it did not reach statistical significance.

REFERENCES

1. Taberna M, Gil Moncayo F, Jané-Salas E, Antonio M, Arribas L, Vilajosana E, Peralvez Torres E, Mesía R. The multidisciplinary team (MDT) approach and quality of care. *Front Oncol.* 2020 Mar 20;10:85. DOI: 10.3389/fonc.2020.00085; PubMed PMID: 32266126; PubMed Central PMCID: PMC7100151.
2. Shellenberger TD, Weber RS. Multidisciplinary Team Planning for Patients with Head and Neck Cancer. *Oral Maxillofac Surg Clin North Am.* 2018 Nov;30(4):435-444. DOI: 10.1016/j.coms.2018.06.005; PubMed PMID: 30173901.
3. Achieving best practice cancer care: A guide for implementing multidisciplinary care. Melbourne Australia: Metropolitan Health and Aged Care Services Division, 2007, pp. 1-18. [cited 2021 July 28] Available from: <https://content.health.vic.gov.au/sites/default/files/migrated/files/collections/policies-and-guidelines/m/multidisciplinarypolicy0702---pdf.pdf>.
4. Townsend M, Kallogjeri D, Scott-Wittenborn N, Gerull K, Jansen S, Nussenbaum B. Multidisciplinary Clinic Management of Head and Neck Cancer. *JAMA Otolaryngol Head Neck Surg.* 2017 Dec 1;143(12):1213-1219. DOI: 10.1001/jamaoto.2017.1855; PubMed PMID: 29075744; PubMed Central PMCID: PMC5824300.
5. Friedland PL, Bozic B, Dewar J, Kuan R, Meyer C, Phillips M. Impact of multidisciplinary team management in head and neck cancer patients. *Br J Cancer.* 2011 Apr 12;104(8):1246-8. DOI: 10.1038/bjc.2011.92; PubMed PMID: 21448166; PubMed Central PMCID: PMC3078600.
6. Murphy CT, Galloway TJ, Handorf EA, Egleston BL, Wang LS, Mehra R, Flieder DB, Ridge JA. Survival Impact of Increasing Time to Treatment Initiation for Patients With Head and Neck Cancer in the United States. *J Clin Oncol.* 2016 Jan 10;34(2):169-78. DOI: 10.1200/JCO.2015.61.5906; PubMed PMID: 26628469; PubMed Central PMCID: PMC4858932.
7. Nash R, Hughes J, Sandison A, Stewart S, Clarke P, Mace A. Factors associated with delays in head and neck cancer treatment: case-control study. *J Laryngol Otol.* 2015 Apr;129(4):383-5. DOI: 10.1017/S0022215115000687; PubMed PMID: 25788249.
8. Gódeny M. Prognostic factors in advanced pharyngeal and oral cavity cancer; significance of multimodality imaging in terms of 7th edition of TNM. *Cancer Imaging.* 2014 Apr 28;14(1):15. DOI: 10.1186/1470-7330-14-15; PubMed PMID: 25608735; PubMed Central PMCID: PMC4331821.
9. Manalo MF. Barriers and potential solutions to physician referrals to palliative care service in the Philippines. [Cited 2023 April 03] Available from: https://www.salzburgglobal.org/fileadmin/user_upload/Documents/2010-2019/2016/Session_562/Barriers_and_Potential_Solutions_to_Physician_Referrals_to_Palliative_Care_in_the_Philippines.pdf.
10. Agarwal PD, Phillips P, Hillman L, Lucey MR, Lee F, Mezrich JD, Said A. Multidisciplinary management of hepatocellular carcinoma improves access to therapy and patient survival. *J Clin Gastroenterol.* 2017 Oct 1;51(9):845-9. DOI: 10.1097/MCG.0000000000000825; PubMed PMID: 28877082.